Claims

1.   A method of topology propagation in a distributed computing environment, said method comprising:

    sending group connectivity messages from at least one group leader to identified nodes of at least one group of nodes within the distributed computing environment;

    discontinuing said sending of group connectivity messages during a time period of no topology change within the distributed computing environment; and

    reinitiating sending of group connectivity messages from the at least one group leader upon identification of a topology change within the distributed computing environment.

2.   The method of claim 1, wherein the distributed computing environment comprises at least two networks each having at least one group of identified nodes, and wherein said method further comprises employing within each group of the at least two networks a heartbeat protocol to ensure continued presence of each identified node within the group.

3.   The method of claim 2, wherein the at least two networks of the distributed computing environment comprise heterogenous networks.

1   4.   The method of claim 2, wherein at least one node

2 of the distributed computing environment has at least two

3 adapters, said at least two adapters coupling said at least

4 one node to said at least two networks, and wherein said

5 sending comprises sending first group connectivity messages

6 (GCMs) from a first group leader to identified nodes of a

7 first group of nodes on a first network of said at least two

8 networks, said at least one node comprising an identified

9 node of said first group of nodes, and forwarding said first

10 GCMs by said at least one node to a second group of nodes on

11 a second network of said at least two networks.

1   5.   The method of claim 4, wherein said first GCMs

2 received at identified nodes of said first group of nodes

3 and identified nodes of said second group of nodes are

4 employed by each said identified node to update a local

5 network connectivity table (NCT).

1   6.   The method of claim 4, wherein said sending

2 further comprises sending second GCMs from a second group

3 leader to identified nodes of the second group of nodes, and

4 forwarding said second GCMs by said at least one node to the

5 first group of nodes on the first network of the at least

6 two networks.

1   7.   The method of claim 6, wherein said sending second

2 GCMs by said second group leader is responsive to receiving

3 new information in said forwarded first GCMs .at said second

4 group leader.

1   8.   The method of claim 6, wherein said discontinuing
2 comprises for each group leader discontinuing said sending
3 of group connectivity messages when a number of messages
4 sent from the group leader reaches a set limit after
5 identification by said group leader of a topology change
6 within the distributed computing environment.

1   9.   The method of claim 8, wherein said reinitiating
2 comprises identifying said topology change within a
3 distributed computing environment, said identifying
4 comprising at least one of: receiving at a group leader a
5 node connectivity message which conflicts with a local
6 network connectivity table value, receiving at a group
7 leader a group connectivity message which conflicts with a
8 local network connectivity table value, identifying that a
9 local adapter belongs to a different adapter membership
10 group, or identifying that a local adapter has become
11 disabled.

1   10. The method of claim 1, wherein said discontinuing
2 comprises for each group leader discontinuing said sending
3 of group connectivity messages when a number of messages
4 sent from the group leader reaches a set limit after
5 identification of the topology change within the distributed
6 computing environment.

1   11. The method of claim 1, further comprising
2 implementing said sending, said discontinuing, and said
3 reinitiating without employing acknowledgment messages
4 during said topology propagation.

1   12.   The method of claim 1, wherein said reinitiating

2 sending of group connectivity messages comprises at least

3 one of receiving at a group leader a node connectivity

4 message which conflicts with a local network connectivity

5 table value, receiving at a group leader a group

6 connectivity message which conflicts with a local network

7 connectivity table value, identifying that a local adapter

8 belongs to a different adapter membership group, or

9 identifying that a local adapter has become disabled.

1   13. A system for topology propagation in a distributed

2 computing environment, said system comprising:

3   means for sending group connectivity messages from

4   at least one group leader to identified nodes of at

5   least one group of nodes within the distributed

6   computing environment;

7   means for discontinuing said sending of group

8   connectivity messages during a time period of no

9   topology change within the distributed computing

10   environment; and

11   means for reinitiating sending of group

12   connectivity messages from the at least one group

13   leader upon identification of a topology change within

14   the distributed computing environment.

1   14. The system of claim 13, wherein the distributed

2 computing environment comprises at least two networks each

3 having at least one group of identified nodes, and wherein

4 said system further comprises means for employing within

5 each group of the at least two networks a heartbeat protocol

6 to ensure continued presence of each identified node within

7 the group.

1   15. The system of claim 14, wherein the at least two

2 networks of the distributed computing environment comprise

3 heterogenous networks.

1   16.   The system of claim 14, wherein at least one node
2   of the distributed computing environment has at least two
3   adapters, said at least two adapters coupling said at least
4   one node to said at least two networks, and wherein said
5   means for sending comprises means for sending first group
6   connectivity messages (GCMs) from a first group leader to
7   identified nodes of a first group of nodes on a first
8   network of said at least two networks, said at least one
9   node comprising an identified node of said first group of
10   nodes, and means for forwarding said first GCMs by said at
11   least one node to a second group of nodes on a second
12   network of said at least two networks.

1   17.   The system of claim 16, wherein said first GCMs
2   received at identified nodes of said first group of nodes
3   and identified nodes of said second group of nodes are
4   employed by each said identified node to update a local
5   network connectivity table (NCT).

1   18.   The system of claim 16, wherein said means for
2   sending further comprises means for sending second GCMs from
3   a second group leader to identified nodes of the second
4   group of nodes, and means for forwarding said second GCMs by
5   said at least one node to the first group of nodes on the
6   first network of the at least two networks.

1   19.   The system of claim 18, wherein said means for
2   sending second GCMs by said second group leader is
3   responsive to receiving new information in said forwarded
4   first GCMs at said second group leader.

1   20.   The system of claim 18, wherein said means for
2   discontinuing comprises for each group leader means for
3   discontinuing said sending of group connectivity messages
4   when a number of messages sent from the group leader reaches
5   a set limit after identification by said group leader of a
6   topology change within the distributed computing
7   environment.

1   21.   The system of claim 20, wherein said means for
2   reinitiating comprises means for identifying said topology
3   change within a distributed computing environment, said
4   means for identifying being responsive to at least one of:
5   receiving at a group leader a node connectivity message
6   which conflicts with a local network connectivity table
7   value, receiving at a group leader a group connectivity
8   message which conflicts with a local network connectivity
9   table value, identifying that a local adapter belongs to a
10   different adapter membership group, or identifying that a
11   local adapter has become disabled.

1   22.   The system of claim 13, wherein said means for
2   discontinuing comprises for each group leader means for
3   discontinuing said sending of group connectivity messages
4   when a number of messages sent from the group leader reaches
5   a set limit after identification of the topology change
6   within the distributed computing environment.

1   23.   The system of claim 13, wherein said means for
2   sending, said means for discontinuing, and said means for
3   reinitiating are implemented without employing
4   acknowledgment messages during said topology propagation.

1   24. The system of claim 13, wherein said means for

2   reinitiating sending of group connectivity messages is

3   responsive to at least one of receiving at a group leader a

4   node connectivity message which conflicts with a local

5   network connectivity table value, receiving at a group

6   leader a group connectivity message which conflicts with a

7   local network connectivity table value, identifying that a

8   local adapter belongs to a different adapter membership

9   group, or identifying that a local adapter has become

10   disabled.

1   25. At least one program storage device readable by a

2   machine tangibly embodying at least one program of

3   instructions executable by the machine to perform a method

4   of topology propagation in a distributed computing

5   environment, comprising:

6   sending group connectivity messages from at least

7   one group leader to identified nodes of at least one

8   group of nodes within the distributed computing

9   environment;

10   discontinuing said sending of group connectivity

11   messages during a time period of no topology change

12   within the distributed computing environment; and

13   reinitiating sending of group connectivity

14   messages from the at least one group leader upon

15   identification of a topology change within the

16   distributed computing environment.

1   26. The at least one program storage device of claim

2   25, wherein the distributed computing environment comprises

3   at least two networks each having at least one group of

4   identified nodes, and wherein said method further comprises

5   employing within each group of the at least two networks a

6   heartbeat protocol to ensure continued presence of each

7   identified node within the group.

1   27. The at least one program storage device of claim

2   26, wherein the at least two networks of the distributed

3   computing environment comprise heterogenous networks.

1   28. The at least one program storage device of claim
2   26, wherein at least one node of the distributed computing
3   environment has at least two adapters, said at least two
4   adapters coupling said at least one node to said at least
5   two networks, and wherein said sending comprises sending
6   first group connectivity messages (GCMs) from a first group
7   leader to identified nodes of a first group of nodes on a
8   first network of said at least two networks, said at least
9   one node comprising an identified node of said first group
10   of nodes, and forwarding said first GCMs by said at least
11   one node to a second group of nodes on a second network of
12   said at least two networks.

1   29. The at least one program storage device of claim
2   28, wherein said first GCMs received at identified nodes of
3   said first group of nodes and identified nodes of said
4   second group of nodes are employed by each said identified
5   node to update a local network connectivity table (NCT).

1   30. The at least one program storage device of claim
2   28, wherein said sending further comprises sending second
3   GCMs from a second group leader to identified nodes of the
4   second group of nodes, and forwarding said second GCMs by
5   said at least one node to the first group of nodes on the
6   first network of the at least two networks.

1   31. The at least one program storage device of claim
2   30, wherein said sending second GCMs by said second group
3   leader is responsive to receiving new information in said
4   forwarded first GCMs at said second group leader.

1   32. The at least one program storage device of claim
2 30, wherein said discontinuing comprises for each group
3 leader discontinuing said sending of group connectivity
4 messages when a number of messages sent from the group
5 leader reaches a set limit after identification by said
6 group leader of a topology change within the distributed
7 computing environment.

1   33. The at least one program storage device of claim
2 32, wherein said reinitiating comprises identifying said
3 topology change within a distributed computing environment,
4 said identifying comprising at least one of: receiving at a
5 group leader a node connectivity message which conflicts
6 with a local network connectivity table value, receiving at
7 a group leader a group connectivity message which conflicts
8 with a local network connectivity table value, identifying
9 that a local adapter belongs to a different adapter
10 membership group, or identifying that a local adapter has
11 become disabled.

1   34. The at least one program storage device of claim
2 25, wherein said discontinuing comprises for each group
3 leader discontinuing said sending of group connectivity
4 messages when a number of messages sent from the group
5 leader reaches a set limit after identification of the
6 topology change within the distributed computing
7 environment.

1   35. The at least one program storage device of claim
2 25, further comprising implementing said sending, said
3 discontinuing, and said reinitiating without employing
4 acknowledgment messages during said topology propagation.

1   36.   The at least one program storage device of claim
2   25, wherein said reinitiating sending of group connectivity
3   messages comprises at least one of receiving at a group
4   leader a node connectivity message which conflicts with a
5   local network connectivity table value, receiving at a group
6   leader a group connectivity message which conflicts with a
7   local network connectivity table value, identifying that a
8   local adapter belongs to a different adapter membership
9   group, or identifying that a local adapter has become
10   disabled.

* * * * *